

# Kunal Kapila

Bachelor of Science, Mathematics and Scientific Computing  
Double Major, Computer Science and Engineering

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## Education

- **Indian Institute of Technology, Kanpur** 2014 - 2019 (Expected)  
Cumulative Grade Point Average 9/10
- **All India Senior School Certificate Examination (AISSCE)**  
Central Board of Secondary Education (CBSE), Govt. of India; Delhi Public School, R. K. Puram
  - 98.2% (School Topper) with National top 1% in Computer Science & Chemistry 2014
  - Cumulative Grade Point Average (CGPA) 10/10 2012

## Academic and Co-Curricular Achievements

- Secured AIR 116 in **JEE Mains** 2014 amongst 1.5 million candidates
- Secured AIR 1306 in **JEE Advanced** 2014 amongst 150,000 candidates
- Secured Rank 29 in **ACM-ICPC Amritapuri** Onsite Round 2015 amongst 200 college teams that qualified for it
- Secured Rank 54 in **ACM-ICPC Amritapuri** Online Round 2015 amongst 1500 college teams
- **Microsoft Code.Fun.Do**
  - **Winner 2014-15:** Graphing app to plot implicit 2D Mathematical Functions for Windows Phone Platform
  - **National 5<sup>th</sup>, Coding Milestone, Finalist Forum 2014-15:** Educational app to teach students programming on the go for Windows Phone Platform; Implemented Scratchpad, Lessons & Daily Challenges
  - **Winner 2015-16:** Front-end for open source program simulation code for Microsoft Windows Store
- Qualified for & attended **International Olympiad of Informatics Training Camp** 2014
- **Kishore Vaigyanik Protsahan Yojna** Fellow 2013, Department of Science & Technology, Government of India
- **Junior Science Talent Search Examination** Scholar 2012, Directorate of Education, Government of Delhi
- **National Talent Search Examination** Scholar 2010, conducted by NCERT, Government of India

## Work Experience

- Development Intern, **IITK NYC Office** MAY 2016 - current  
*Supervisor: Prof. Manindra Agrawal, Department of CSE, IIT Kanpur*
  - Working on the backend of a distributed web application
  - Refactored the core code base to make managing code easier including the database schema
  - Currently implementing the feature of efficiently recording history of changes made on a specific data
- Web Developer (Intern), **Elanic**, Bangalore DEC 2015
  - Full stack developer: MongoDB, AngularJS and NodeJS along with Restify framework
  - Built REST APIs for notification, engagement(likes, comments) and search (using Elastic Search) modules

## Projects

- **PhotoProof:** Cryptographic Image Authentication JUN 2016 - current  
*Supervisor: Prof. Nasir Memon, (Department Head) Department of CSE, NYU School of Engineering*
  - Understood the theoretical model for image authentication based on Proof-Carrying Data (PCD)
  - Currently working on a practical implementation of the idea described in the paper using libsark's PCD
- **Cimulator:** a Visual & Interactive Tutoring system MAY - JUL 2015  
*Supervisor: Prof. Amey Karkare, Department of CSE, IIT Kanpur* Tested by 400 students in Fall 2015
  - Interpreter for C language in python, modelled memory artificially, handled external header files & overflows
  - Prompts user with possible corrections for runtime errors instead of crashing abruptly (unlike gcc)
  - Web interface to **simulate C codes** that were interpreted by Cimulador to provide visual cues to the user

## Technical Skills

- **Languages:** C, C++, Python, Scala
- **Web Development:**  
HTML, CSS, Javascript, Bootstrap, PHP, Node.js (with Express, Restify), AngularJS, MySQL, MongoDB
- **Tools:**  $\LaTeX$ , Git, Vim, OpenGL, SDL, Octave, iPythonNotebook

## Course Projects

- **Animation Movie**

OCT - NOV 2015

Supervisor: Prof. Vinay P. Namboodari, Department of CSE, IIT Kanpur

- Rendered a 3-minute movie clip using **OpenGL** (Graphics Library), **SDL** (Simple DirectMedia Layer)
- Implemented Keyframe animation, DeBoor's B-Spline Interpolation, Texture Mapping, Lighting, Physics-based collision detection, Dynamic Programming and integrated audio

- **Randomness Certification using Quantum Non-Locality**

FEB - APR 2016

Supervisor: Prof. Rajat Mittal, Department of CSE, IIT Kanpur

- Understood Bell inequalities, EPR Paradox and studied classical and quantum strategies for non local games for the CHSH game
- Studied how non local correlations of quantum states can be used to generate certified randomness
- Click [here](#) to view the final project report

- **Students' Gymkhana Form Automation**

MAR - APR 2016

Supervisor: Prof. Sumit Ganguly, Department of CSE, IIT Kanpur

- LAMP stack based Web application to automate the Senator Seed Fund (SSF) Form
- Authentication based system to propose, approve and reject SSF forms
- Manages role based user groups and permissions

## Relevant Courses Undertaken

<b>Mathematics</b>	Mathematics I (Functional Analysis)	Mathematics II (Linear Algebra)
	Real Analysis	Complex Analysis
	Abstract Algebra	Commutative Algebra (*)
	Probability & Statistics	Mathematical Logic
	Introduction to Fourier Series (*)	Several Variable Calculus (*)
<b>Computer Science</b>	Fundamentals of Computing (A*)	Data Structures and Algorithms (A*)
	Algorithms II (*)	Elliptic Curves and its Applications (*)
	Modern Cryptology	Quantum Computing
	Principles of Database Systems	Introduction to Computer Graphics
<b>Others</b>	Introduction to Economics (A*)	Introduction to Philosophical Logic

(A\*) Awarded for exceptional performance

(\*) Courses in Progress

## Positions of Responsibility

- **Coordinator, Programming Club**, Science and Technology Council, IIT Kanpur

MAR 2016 - current

- Currently the Coordinator of the Programming Club of IIT Kanpur, one of the the largest student programming community of India, managing a team of 20 secretaries.
- Conducted several lecture series, workshops and competitions on Algorithmic Programming, Open Source Development, and Web Development for students of the campus community
- Organised the summer camp and mentored over 60 students who completed projects in the field of Web & App Development, Augmented Reality, Machine Learning, Computer Vision and Ethical Hacking

- **Head Web, Antaragni**, Students' Gymkhana, IIT Kanpur

MAR 2016 - current

- Conceptualised and designed the website for Antaragni 2016 (<http://antaragni.in/>)
- Implemented server using MEAN stack, along with *ejs* for templating & *passport* for facebook authentication
- Dynamically rendered the contacts & sponsors page from the database

- **Student Member, Senate Undergraduate Committee (SUGC)**, IIT Kanpur

(2014-15) & (2015-16)

- Amongst the 4 student members nominated by the Students' Senate, responsible for representing the opinions of more than 3500 undergraduate students in campus on academic matters in SUGC, a standing committee of the Institute Senate
- Worked on proposals like remedial programme for academically deficient students, Undergraduate Teaching Assistants, Modifying HSS lottery to accomodate more students & Lateral Entry for Bachelors programme in Physics, Chemistry and Mathematics